

## ANALYSIS OF THE DEMAND FOR CERTIFIED MAIZE SEEDS IN EKITI AND ONDO STATES, NIGERIA: IMPLICATIONS FOR FOOD SECURITY

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### ABSTRACT

This study analyzed and discussed the demand for certified maize Seeds and its implication on food security in Ekiti and Ondo States. Specifically, the determinants of certified maize seeds were identified and estimated. Primary data were collected using structured questionnaire administered on 196 maize farmers randomly selected in the study area. Descriptive statistics and multiple regression were used for data analysis. Regression results showed that yield/ha; own price of certified maize Seeds; distance travelled to purchase maize seeds; size of farm land put into Maize production and price/kg of certified rice seeds as substitute explained 67% of the variations in the quantity of certified maize seed demanded at 5% level of significance. The demand was inelastic and will promote maize production in a deregulated economy.

**KEYWORDS:** Food production, Ondo State, Ekiti State, Food security, Food shortage

### INTRODUCTION

Nigeria's inability to feed her teeming population has remained an intractable problem for almost three decades. Although, there has been no major famine, the Country has failed to produce food in adequate quantity and quality to feed her populace. According to FAO (1986), Nigeria's population and food production growth rates (between 1980 and 1986) were approximately 3.4% and 3.0% per annum respectively. Daramola (2004) claimed that the rate of domestic food production had fallen below population growth rate, thereby creating a situation of food shortages and scarcity.

One important aspect of the wealth of a nation is the availability of food for the populace. It is in this connection that food security becomes an important factor in any consideration for sustaining the wealth of the nation. Attempts to achieve food security in Nigeria consist of two approaches namely, importation of essential food commodities as a short term measure and increased domestic food crops' production as a long term measure. The latter measure includes the National Accelerated Food Production Project (NAFPP), Operation Feed the Nation (OFN), Agricultural Development Project (ADP) and National Seed Multiplication Scheme (NSMS).

It is true that there cannot be a revolution in agricultural productivity without a break-through in agricultural innovation (Preferably endogenous). Such a break through may be biological, chemical or mechanical or a combination of two or all of these innovations (Aderinola, 1983). For instance, the increases in Japan's agricultural productivity was due to a combination of biological and chemical innovations, which resulted in substantial increases in crop output per unit of land thereby loosening the constraints imposed by land scarcity and high land prices (Essan, 1975). On the other hand, the dramatic increases in the United States of America's (U.S.A's) Agricultural Productivity resulted from the production of mechanical power, which being labour-saving, loosened the constraints imposed by labour scarcity and high wages.

Biological innovations as a means of raising land and labour productivities are as a result of certain attributes of seeds which are certified with the issuance of certificates guaranteeing the attributes by a third party. These attributes include improved genetic performances which may include resistance and early maturity, all of which lead to higher potential crop yield per unit of land. Although, all certified seeds have improved attributes, not all improved seed varieties are certified.

Certified seeds are the most Important input for boosting crop production. Usman (1994) posited that the position of certified seeds does not only improve the economy of local seed growers, it is one of the best means of transferring technology. He added that certified seeds was not only the cheapest and basic means of increasing crop yield, it was also fundamental to raising the efficiency of other agricultural inputs.

Available information show that considerable achievements have been made in developing, testing and certifying High-yield varieties (HYVs) of seeds for many of our major food crops by various Research Institutes, Universities and Colleges of Agriculture as presented in Table 1. The table shows that there are certified seeds, the potential yields \ha of which are much higher than the 'actual yields \ha *ceteris paribus*. For example, the table shows that the potential output\ha of the cereals ranged from 166.7% and 385.7% of the actual yield \ha with those of maize and upland rice being approximately 386.0% and 200% respectively.

TABLE 1: Actual and Potential Yields of Cereals and Tuber Crop. in Nigeria.

Crops	Actual Yield (t/ha)		Potential Yield (t/ha)		Potential as % of Actual Yield..
	Range	*Mean	Range	Mean.	
Upland rice	0.080-120	1.00	1.50-2.50	2.00	200.0
Lowland rice	1.00-2.00	1.50	2.50-8.00	5.25	350.0
Maize	1.50-2.00	1.75	3.50-10.00	6.75	385.7
Sorghum	0.50-2.00	1.25	2.00-2.50	2.25	180.0
Millet	0.50-1.00	0.75	1.00-1.50	1.25	166.7
Wheat	0.50-1.00	0.75	1.00-2.00	1.50	200.0
Cassava	11.00-12.00	11.50	25.00-40.00	32.50	282.6
Irish Potato	10.00-12.00	11.50	14.00-15.00	14.50	131.8
Sweet Potato	10.00-12.00	11.00	14.00-15.00	14.50	131.8
Yam	12.00-14.00	13.00	18.00-20.00	19.00	146.2

Note: . Indicates crops (seeds of interest to this study).

Source: Usman, TA Maini, N.S. Joshua, A and Falusi, AO. (1992):

For tuberous crops, cassava has the highest potential yield/ha which almost quadruples its actual yield/ha. The implication of the above is that, there are available in the Country, varieties of cereal crops, the seeds of which are capable of doubling or tripling the outputs\ha obtained at present, all other factors remaining unchanged.

Although; a number of HYVs of seeds have been developed and tested in Nigeria by various Research Institutes, Universities and Colleges of Agriculture as a means of ensuring food security in Nigeria, many of the seeds are either not available to farmers or are not adopted because they do not conform with 'the socio-cultural background of the farming communities to which they are introduced. Even, when they are adopted, supplementary inputs such as fertilizers, irrigation water; credit and, pesticides needed to obtain optimum output from the certified seeds are not available. Despite the importance of HYV's as a means of increasing food crop output in different parts of the world, little is known about the nature of demand for them. Nigerians National Seed Service (NSS) has once lamented that there is no reliable information on actual demand for improved seeds in the Country. This implies that the projection for high quality seeds in Nigeria has not been based on reliable data.

In view of the above, this paper identifies, quantifies and estimates the factors influencing the demand for certified maize seeds in 'the States and their implications for food security.

#### METHODOLOGY

Primary data were collected from 196 farmers through the use of questionnaire which was administered on farmers buying certified maize seeds in Ondo and Ekiti States. The respondents were selected using multistage random sampling; two out of the four - agricultural zones of Ondo and Ekiti States were first picked, followed by two local governments, from each zone and three towns/villages from each LGA. Ten percent of farmers growing certified seeds was randomly selected from the list made with the assistance of the staff of Agricultural Input Supply Company (AISC) and Agricultural Development Project (ADP). Data were analyzed using descriptive statistics and multiple regression analysis involving the use of ordinary least square (OLS) method, to estimate the functional relationship between the dependent variable and set of explanatory variables for certified seeds of maize. Informed

partly by past studies on input demand (Idachaba, 1980, Ladipo and Adeyemo 1981, Osundare, 1998) etc, a linear function was specified as in equation (1)

$$QM_{ij} = a_0 + a_1PM_{ij} + a_2PR_{ij} + a_3FM_{ij} + a_4DM_{ij} + a_5YM_{ij} + EM_{ij} \dots\dots\dots (1)$$

$QM_{ij}$  = Quantity of certified maize seed purchased by the  $i$ th grower in the  $j$ th year (kg);

$PM_{ij}$  = Price/kg of maize seed bought by the  $i$ th grower in the  $j$ th year (N)

$PR_{ij}$  = Price/kg of rice seeds bought by the  $i$ th grower in the  $j$ th year (N)

$DM_{ij}$  = Distance traveled by the  $i$ th grower to buy certified maize seeds in the  $j$ th year (km)

$FM_{ij}$  = Size of the maize plot of the  $i$ th grower in the  $j$ th year (ha)

$YM_{ij}$  = Quantity of maize produced (kg) by  $i$ th grower in the  $j$ th year (kg)

$EM_{ij}$  = Error term associated with collecting information from the  $i$ th maize grower in the  $j$ th year.

TABLE 2: Estimated Demand Model for Certified Maize Seeds in Ondo and Ekiti States Nigeria, (Logarithmic Functions Dependent Variable=Log of Certified Maize seeds Demanded )

Logarithm of Independent variables							
Constant	$PM_{ij}$	$PR_{ij}$	$DM_{ij}$	$FM_{ij}$	$YM_{ij}$	$R^2$	DW
40.674	0.719*	-0.525*	0.275*	0.158*	0.119*		
(0.300)	(0.135)	(0.230)	(0.135)	(0.034)	(0.029)	0.67	1.63

Notes: Indicates that estimated coefficients were significant at the 5% level.

## RESULTS AND DISCUSSION

Regression results showed that own-price of certified maize seeds, price of close substitutes, farm size, distance traveled and expected output explained 66.6% of the variation in the quantities of certified maize seeds purchased. The F - test indicated that the models were significant at the 5% level. With the exception of the positive sign on the coefficients of log  $PM_{ij}$  the signs on the coefficients of other variables conformed with the postulates of economic theory.

The positive signs on the coefficients of Log  $PM_{ij}$  suggested that an increase in the price of certified maize seeds leads to an increase in the quantity of maize seeds demanded. This could be attributed to the following reasons:(1) the rise in price of certified seeds caused the buyers to purchase more quantity in anticipation of future rise in price probably due to irregular supply and scarcity of certified maize seeds; (2) farmers got their seeds from government sources at subsidized price; (3) the priority given to certified seeds of maize because of its central position among all other inputs and (4) the fact that farmers were more aware and convinced about the attributes of certified maize seeds year in –year-out.

The positive signs on the coefficient of each of the other variables in equations (1) suggested that an increase in each of the variables would cause the quantity of certified maize seed demanded to increase all other factors remaining unchanged. For instance, the positive sign on the coefficient of Log  $FM_{ij}$  suggested that the larger the farm size, the greater the quantity of certified maize seeds purchased. Similarly the positive sign on the coefficient of Log  $DM_{ij}$  implied that the farther the distance traveled by buyers, the greater the quantity of certified maize seeds demanded. This is contrary to expectation. The possible explanation could be that farmers pooled their resources together for collective purchase or farmers bought in large quantities and stored to reduce the frequency of visiting the source of supply.

Results also showed that all the estimated coefficient were significantly different from zero at the 5.0% while the Durbin - Waston test indicated absence of serially correlated residuals.

## CONCLUSION, IMPLICATIONS FOR POLICY AND FOOD SECURITY

The evidence that the demand for certified seeds was price inelastic (Table 2) implies that farmers were mindful of the quality of the seeds rather than their prices. It suggests that maize farmers in the State appreciate the use of certified seeds as a means of increasing food crop output and would purchase improved seeds of this food crop provided they are sure of their qualities all other things being equal. These findings can be manipulated and exploited to a great advantage for food security under the present cost recovery principle of the Nigerian Seed

Industry. For instance, subsidizing the price of certified seed as a policy measure to increase the demand for certified seeds may be misplaced in that farmers may not make judicious use of the seeds. Secondly farmers may miss control the low price to mean low seed quality thus reducing the quantity demanded of the seeds

Considering the significance of Farm size (Table 2) positive relationship existing between farm size and quantity of certified maize seeds demanded ( $\log QM_{ij}$ ), and the experience gathered from past studies on input demand, the small farm size of less than 2 hectares implies that farm size is the most limiting factor among the variables specified. Therefore for farmers to increase their maize output to meet family food need and income, the area of land under cultivation must be increased. The tractor hiring, services for land preparation and planting operations should be revived, subsidized and made to operate more efficiently. Government should also sustain the interest of farmers in the use of certified seeds through regular and adequate supply of HYV seeds and supplementary inputs as a way of ensuring food security in Nigeria.

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